

REMARKS/ARGUMENTS

Claims 16-19 have been canceled. Claims 1, 7, and 8 have been amended. Claims 20 and 21 have been added. Claims 1-15 and 20-21 are pending.

The Applicant confirms the election of Group I, claims 1-15.

Claim rejections under 35 USC § 112

The Examiner rejected claim 1-15, under 35 USC § 112, stating the limitation "the plasma processing chamber" on line 4 of claim 1 has insufficient antecedent basis. Claim 1 has been amended accordingly.

Claim rejections under 35 USC § 103

The Examiner rejected claims 1-6 and 10-15 under 35 U.S.C. 103(a) as being unpatentable over Chu et al. (US 2004/0192058) in view of Lee et al (US 2003/0151020). The Examiner stated that Chu et al. teaches filling the via using spin-coating process but fail to teach the filling is performed by plasma processing and that Lee et al. teach that filling via/trench by means of known technology in the art including methods of spin coating, jet coating, chemical vapor deposition (CVD) etc. (paragraph [0020]).

It would not be obvious to use the CVD process of Lee et al. in Chu et al. The process described in paragraph [0020] of Lee is for filling a trench 22 to a depth that exceeds the height of surface 16, in essence to completely fill the trench. Chu et al. forms via plugs 30 that partially fill the via. It is not obvious that the CVD process of Lee would be successful in providing via plugs as taught in Chu.

In addition, paragraph [0020] of Lee further teaches that the layer 24 is a conformal layer. The resulting via plugs are non-conformal. It would not be obvious whether the conformal process of Lee would successfully provide non-conformal via plugs.

In addition, the feature 22 described in Lee paragraph [0020] that is filled is a trench. It would not be obvious that the conformal layer 24 used to fill a trench in Lee would be successful in forming via plugs as described in Chu.

The Examiner did not give patentable weight to the phrase "within a single plasma processing chamber providing a combination via plug deposition..." stating that such apparatus limitations should not be given weight unless they affect the process in a manipulative sense. The recitation of a single chamber affects the process in a manipulative sense, in that it limits the steps of deposition and etching the trench to occur in the same chamber. This results in a quicker and more efficient process, since the wafer does not need to be moved from one chamber for deposition to another chamber for etching. This is made possible by using a plasma to form the via plugs. This is not made obvious by the cited references. For at least these reasons, claim 1, as amended, is not made obvious by Chu et al. in view of Lee et al.

Claims 2-6 and 10-15 are ultimately dependent on the independent claim 1. In addition, these claims add additional features, which when taken together with the limitations of the independent claim are not anticipated or made obvious by the cited references. For at least these reasons, claims 2-6 and 10-15 are not anticipated or made obvious by the cited references.

The Examiner objected to claims 7-9 and stated that they would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112 and to include all of the limitations of the base claim and any intervening claims. Claims 7 and 8 have been amended accordingly.

New claims 20 and 21 recite the patentable limitations cited by the Examiner regarding claims 7 and 8. They are method claims and therefore should fall under Group I.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-8300.

Respectfully submitted,
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